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JAPANESE PATENT OFFICE

PATENT ABSTRACTS OF JAPAN

(11) Publication number: 2002076141 A

(43) Date of publication of application: 15.03.02

(51) Int. Cl.

H01L 21/8242

C23C 16/30

H01L 21/318

H01L 27/108

(21) Application number: 2001163267

(22) Date of filing: 30.05.01

(30) Priority: 01.06.00 KR 2000 200030091

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(72) Inventor: KIM KYONG-MIN
SONG HAN SANG(54) METHOD FOR MANUFACTURING CAPACITOR
OF SEMICONDUCTOR MEMORY ELEMENT

(57) Abstract:

PROBLEM TO BE SOLVED: To provide a method for manufacturing the capacitor of a semiconductor memory element capable of improving the electric characteristic of the capacitor by improving the step coverage of a lower electrode.

SOLUTION: The method includes a stage for successively embedding a plug polysilicon film and a barrier metal film in the contact hole of an interlayer insulation film on a semiconductor board, a stage for depositing a cap oxide film, a stage for exposing the interlayer insulation film and a barrier metal film, a stage for forming the nitriding film of a thin film on the whole face by NH₃ gas plasma processing, a stage for depositing a ruthenium film for a lower electrode on the nitriding film, a stage for removing the cap oxide film and forming the lower electrode after the ruthenium film and the nitriding film are chemically and mechanically polished, a stage for removing the cap oxide film to form the lower electrode, a stage for depositing an amorphous TaON thin film on the lower electrode, a stage for thermally treating and

crystallizing the amorphous TaON thin film, and a stage for depositing the metal film on the crystallization TaON thin film as an upper electrode.

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